



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

H.0

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/765,931

01/29/2004

Youichi Kukimoto

Q79041

1863

23373 7590 02/07/2007
SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER

NGUYEN, KHIEM D

ART UNIT

PAPER NUMBER

2823

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
--	-----------	---------------

3 MONTHS

02/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/765,931

Applicant(s)

KUKIMOTO ET AL

Examiner

Khiem D. Nguyen

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-4 and 8-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-4 and 8-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

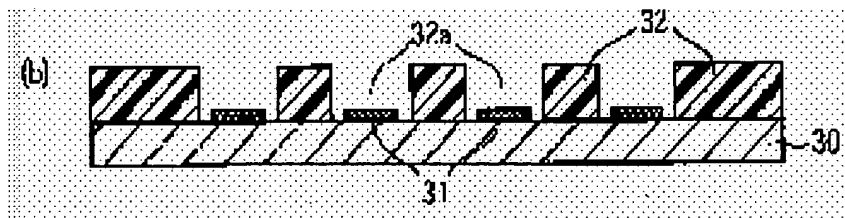
DETAILED ACTION***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

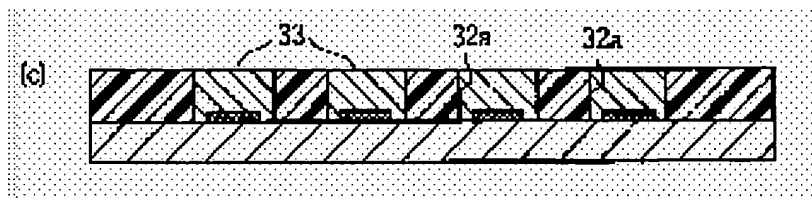
(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 2-4 and 8-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama Seiki ("Method for forming bump", Japan Publication number 2002-334895, English translation) in view of Amita et al. (U.S. Pub. 2002/0046627).

In re claim 8, Sakuyama discloses a solder deposition method comprising the steps of: forming a dam 32 around an electrodes 31 on a substrate 30 (Detailed Description, pages 1-2, paragraph [0006] and FIG. 3b);

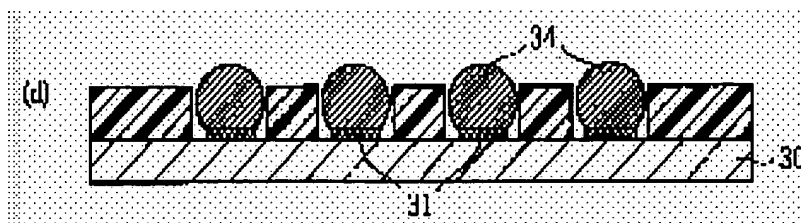


applying a solder precipitating composition 33 to the substrate 30 (FIG. 3c); and



Art Unit: 2823

depositing solder 34 on the surface of the electrode 31 while heating the solder precipitating composition 33 applied (Detailed Description, page 2, paragraph [0006] and FIG. 3d).



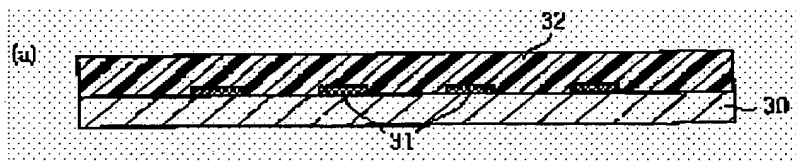
Sakuyama discloses that the solder precipitating composition 33 comprises a pewter paste 33 (Detailed Description, page 2, paragraph [0009] but does not explicitly disclose or suggest wherein the solder precipitating composition comprises a tin powder, and a complex of at least one member selected from the group consisting of silver ions and copper ions, and at least one member selected from the group consisting of aryl phosphines, alkyl phosphines and azoles.

Amita, however, disclose a solder deposition method comprise the steps of applying a solder precipitating composition 10 to the substrate 12 wherein the solder precipitating composition comprises a tin powder, and a complex of at least one member selected from the group consisting of silver ions (Sn-Ag) and copper ions (Sn-Cu), (page 4, paragraph [0063] and FIG. 3) and at least one member selected from the group consisting of azoles (benzotriazole) (page 8, paragraph [0115]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sakuyama and Amita to enable the process of applying a solder precipitating composition comprises a tin powder, and a complex selected from silver ions and azoles of Sakuyama to be performed and

furthermore to obtain a solder powder which have excellent storage stability and ensure excellent properties in and after reflow (page 1, paragraph [0003], Amita) and also prevent the circuit copper from rusting (page 8, paragraph [0115], Amita).

In re claim 2, as applied to claim 8 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein forming a dam includes the steps of: forming a resin film 32 on the surface of the substrate 30 (FIG. 3a); and

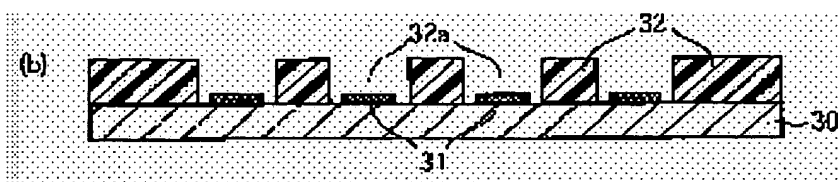


providing an opening part 32a in the resin film 32 so that a dam is formed around an electrode 31 on a substrate 30 (pages 1-2, paragraph [0006], Sakuyama).

In re claim 3, as applied to claim 8 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the dam 32 is not removed after depositing solder 34 (FIG. 3d, Sakuyama).

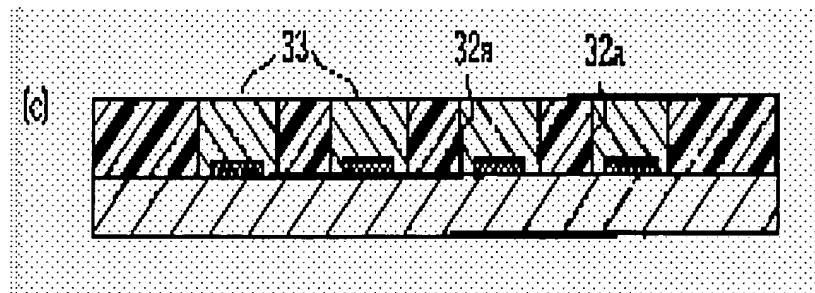
In re claim 4, as applied to claim 8 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the substrate is a via-on-pad structured substrate (pages 1-2, paragraph [0006] and FIGS. 3(a)-(e), Sakuyama).

In re claim 9, Sakuyama discloses a solder deposition method comprising the steps of: forming a dam 32 around an electrodes 31 on a substrate 30 (Detailed Description, pages 1-2, paragraph [0006] and FIG. 3b);

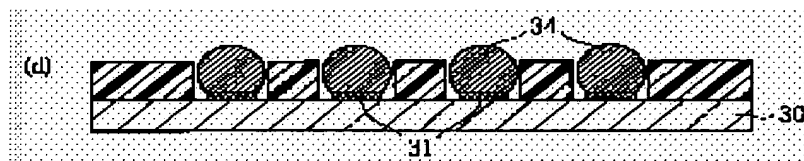


Art Unit: 2823

applying a solder precipitating composition 33 to the substrate 30 (FIG. 3c); and



depositing solder 34 on the surface of the electrode 31 while heating the solder precipitating composition 33 applied (Detailed Description, page 2, paragraph [0006] and FIG. 3d).



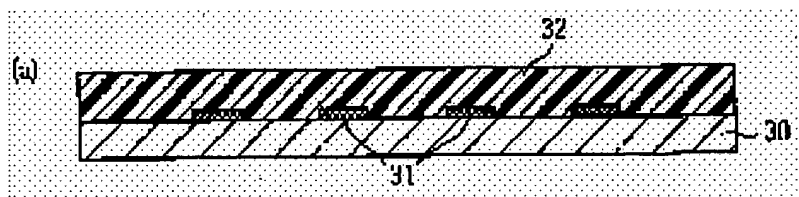
Sakuyama discloses that the solder precipitating composition 33 comprises a pewter paste 33 (Detailed Description, page 2, paragraph [0009] but does not explicitly disclose or suggest wherein the solder precipitating composition comprises a tin powder, and a salt of at least one metal selected from the group consisting of lead, copper and silver.

Amita, however, disclose a solder deposition method comprise the steps of applying a solder precipitating composition 10 to the substrate 12 wherein the solder precipitating composition comprises a tin powder, and a salt of at least one metal selected from the group consisting of lead (Sn-Pb), copper (Sn-Cu) and silver (Sn-Ag) (page 8, paragraph [0115]).

Art Unit: 2823

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teaching of Sakuyama and Amita to enable the process of applying a solder precipitating composition comprises a tin powder, and a salt of at least one metal selected from the group consisting of lead, copper and silver of Sakuyama to be performed and furthermore to obtain a solder powder which have excellent storage stability and ensure excellent properties in and after reflow (page 1, paragraph [0003], Amita) and also prevent the circuit copper from rusting (page 8, paragraph [0115], Amita).

In re claim 10, as applied to claim 9 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein forming a dam includes the steps of: forming a resin film 32 on the surface of the substrate 30 (FIG. 3a); and



providing an opening part 32a in the resin film 32 so that a dam is formed around an electrode 31 on a substrate 30 (pages 1-2, paragraph [0006], Sakuyama).

In re claim 11, as applied to claim 9 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the dam 32 is not removed after depositing solder 34 (FIG. 3d, Sakuyama).

In re claim 12, as applied to claim 9 above, Sakuyama in combination with Amita discloses all claimed limitations including the limitation wherein the substrate is a via-on-pad structured substrate (pages 1-2, paragraph [0006] and FIGS. 3(a)-(e), Sakuyama).

Response to Applicants' Amendment and Arguments

3. Applicant's arguments filed October 31st, 2006 have been fully considered but they are not persuasive.

Applicants contend that the references, Sakuyama Seiki (Japan Pub. No. 2002-334895, English translation), herein known as Sakuyama in view of Amita et al. (U.S. Pub. 2002/0046627), herein known as Amita, does not disclose a solder precipitating composition as recited.

In response to Applicants' contention that Sakuyama in view of Amita does not teach or suggest a solder precipitating composition as recited, Examiner respectfully disagrees.

Applicants' claimed invention required that the solder precipitating composition comprises a tin powder; and a complex of at least one member selected from the group consisting of silver ions and copper ions, and at least one member selected from the group consisting of aryl phosphines, alkyl phosphines and azoles.

Sakuyama discloses a solder deposition process comprising the steps of forming a dam 32 around an electrodes 31 on substrate 20 and applying a solder precipitating composition 33 to the substrate 30 (see Detailed Description, pages 1-2, paragraph [0006] and FIGS. 3b-d), and depositing solder 34 on the surface of the electrode 31 while heating the solder precipitating composition 33 applied. In (Detailed Description, paragraph [0005] and FIG. 2), Sakuyama discloses depositing pewter paste 23 into opening 22a of mask 22. It is well-known to one of ordinary skill in the art at the time of the invention was made that pewter paste is a metal alloy containing tin powder and

copper ions with the addition of lead. Furthermore, on (Detailed Description, page 4, paragraph [0022]), Sakuyama suggests that the solder precipitating composition comprises two or more classes which were chosen from Sn, Pb, Ag, Bi, Cu, In, and Zn. Thus, Sakuyama teaches that the solder precipitating composition comprises a tin powder; and a complex of at least one member selected from the group consisting of silver ions and copper ions.

In view of the above, Sakuyama does not explicitly disclose or suggest wherein the solder precipitating composition further comprises at least one member selected from the group consisting of aryl phosphines, alkyl phosphines and azoles.

The secondary reference, Amita et al., however, discloses applying a solder precipitating composition 10 to the substrate 12 wherein the solder precipitating composition comprises a tin (Sn) powder, and a complex of at least one member selected from the group consisting of silver (Ag) ions and copper (Cu) ions (page 4 paragraphs [0063]-[0065] and FIG. 3), wherein the solder precipitating composition further comprises at least one member selected from the group consisting of azoles such as benzotriazole, benzimidazole or tolyltriazole in order to prevent rusting or oxidation (page 8, paragraph [0115]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to incorporate the teaching of Amita into Sakuyama to enable the completed process of solder precipitation composition of Sakuyama to be performed and furthermore to obtain a solder powder which have excellent storage

Art Unit: 2823

stability and ensure excellent properties in and after reflow (page 1, paragraph [0003], Amita).

For this reason, Examiner holds the rejection proper.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D. Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:30 AM - 5:30 PM).

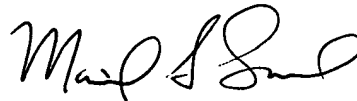
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew S. Smith can be reached on (571) 272-1907. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2823

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

K.N.

January 25, 2007



MATTHEW SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800